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CITATION:

MAKI, FUMIHIKO. A PATHOLOGICAL STUDY ON THE ILEOCECAL LYMPHADENITIS, ESPECIALLY ON THE CHANGE OF NERVES. 日本外科宝函 1959, 28(8): 3085-3096

ISSUE DATE:

1959-09-01

URL:

http://hdl.handle.net/2433/207001

A PATHOLOGICAL STUDY ON THE ILEOCECAL LYMPHADENITIS, ESPECIALLY ON THE CHANGE OF NERVES

by

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〔Received for publication Aug. 4, 1959〕

1. INTRODUCTION

In the laparotomy cases under the clinical diagnosis of appendicitis, surgeons often find the swelled ileocecal lymphglands with or without an inflammatory change in the appendix.

Ukeda (1958) of our clinic found sensory nerves and their free endings in the ileocecal lymphglands of human beings and dogs. His results suggest the occurrence of abdominal pain caused by the ileocecal lymphglands.

Reilly (1934) gave chemical or physical stimulus to the mesenteric lymphglands, and got a pathological change in the intestines with vasodilatation. He considered this phenomenon as a result of irritation of the vegetative nervous networks which were distributed from the mesenteric lymphglands to the intestines.

The author studied the pathological changes in the appendices and the ileocecal lymphglands to observe the relationship between the inflammatory change of the appendix and the swelling of the ileocecal lymphgland. Furthermore, he studied the neurohistological changes in the ileocecal lymphglands.

He considered that the study would give some suggestion on the abdominal pain caused by the irritation of the nerve elements in the ileocecal lymphglands.

2. MATERIALS AND METHODS

Materials were the specimens of the appendices and the ileocecal lymphglands of 23 cases on whom appendectomy was performed under the clinical diagnosis of appendicitis. Immediately after the appendectomy the swelled ileocecal lymphglands were removed. The appendices and the lymphglands were stained with hematxylin-eosin for the histological observation.

A part of the specimens of lymphglands were fixed in 10% neutral formol solution for 3-5 weeks, then they were sliced in 30-50 μ sections with the freezing microtome. These sections were kept further in 10% neutral formol solution for more than 2 months, and then they were impregnated with Bielschowsky's method modified by Suzuki for the observation of nerve fibers.

3. PATHOLOGICAL STUDY OF THE ILEOCECAL LYMPHGLAND AND THE APPENDIX

The appendices showed various degrees of intensity of inflammation, while the ileocecal lymphglands of the same patients usually gave no feature of purulent inflammation, except in one case in which there was a marked neutrophil leucocytes infiltration in the medullary sinus and the germcenter.

The inflammatory changes in the ileocecal lymphglands, though they were very complicated, were classified into the following 4 groups according to MIYAJI's and YOSHIMATSU's classifications for the convenience of a comparative study with the change in appendix. There were some specimens which showed changes belonging to more than 2 groups, which the author classified into single group in accordance with their principal change.

1) Lymphglands with acute inflammation.

The principal change in these lymphglands was the reaction in the sinus; the sinus was dilated with the inflammatory exudation, in which a marked increase of the lymphocytes and the monocytes, and a few of the neutrocytes were observed. The number of the reticuloendothelial cells did not indicate a marked increase. These changes correspond with simple acute lymphadenitis (Fig. 1-2).

There were 9 cases which belonged to this group.

2) Lymphglands with chronic inflammation.

The main change was observed in the reaction of the reticuloendothelial cells; they proliferated, filled the sinus and caused atrophy of the parenchyma. Usually, there were only a small number of the lymphocytes, the monocytes and the eosinophils in the sinus. In many cases, the capsule, the marginal sinus and the cortex gave a feature of fibrosis, which was considered as a change having resulted from previous acute lymphadenitis (Fig 3).

10 specimens belonged to this group.

3) Lymphglands with hyperplasia of the lymphatic tissue.

The lymphatic tissue proliferated in the parenchyma, and many of the sinus were pressed by the swelled lymph follicles. These changes were considered as a result of repeated slight stimulus given to them (Fig 4).

These changes were found in 3 cases.

4) Lymphgland with tuberculous inflammation.

In only one case there was a tuberculous change of lymphgland. There was an isolated typical tubercle with giant cells and epithelioid cells in the cortex without caseation. An appearance of an acute lymphadenitis with dilated sinus and an increase in number of the lymphocytes and the monocytes within them, were found in the areas other than tubercle (Fig. 5).

The changes in the ileocecal lymphgland were studied as compared with those of the appendix in each case.

The inflammatory changes of the appendices were divided into 2 groups, i. e. acute and chronic appendicitis. All of the specimens with acute appendicitis were in a purulent or gangrenous change, and no catarrhal appendicitis was observed among them. Fibrosis of the appendix wall, irregular arrangement of the muscle fibers and proliferation of the adipose tissue in the submucous layer were regarded

as an important pathological change in chronic appendicitis.

The pathological changes of the ileocecal lymphglands as compared with the changes of appendices in the same patients were shown in Table 1.

Table. 1

	pathological changes of the ileocecal lymphglands				
pathological changes of the appendices	acute lymphadenitis	chronic lymphadenitis	hyperplasia of the lymphatic tissue	tuberculous lymphadenitis	total
acute appendicitis	5 cases	2 cases	1 case	1 case	9 cases
chronic appendicitis	1 case	6 cases	—	—	7 cases
normal appendices	3 cases	2 cases	2 cases	—	7 cases
total	9 cases	10 cases	3 cases	1 case	23 cases

5 of 9 cases of acute ileocecal lymphadenitis had acute inflammation in the appendix. 6 of 10 cases of chronic ileocecal lymphadenitis had chronic inflammation in the appendix.

On the other hand, 5 of 9 cases of acute appendicitis had acute inflammation in the ileocecal lymphglands. 6 of 7 cases of chronic appendicitis had chronic inflammation in the ileocecal lymphglands.

These findings suggested that the inflammatory change in the ileocecal lymphgland had something to do with that of the appendix; acute appendicitis induced the acute inflammatory reaction of the lymphgland, and in the chronic stadium of the appendicitis, the reaction of the lymphgland would be altered to a chronic inflammatory change.

However, in 7 cases who complained of ileocecal pain without any inflammatory change in the appendix, an acute inflammation of the ileocecal lymphgland was found in 3 cases, a chronic one in 2 cases and a hyperplasia of the lymphatic tissue in the rest.

4. NEURO-PATHOLOGICAL STUDY OF THE INFLAMMATORY ILEOCECAL LYMPHGLAND

Ito (1943), Sunder-Plasmann (1953) and Ukeda (1958) have reported on the distribution of the nerve fibers in the lymphgland.

The results of the present study on the nerve fibers distributed in the ileocecal lymphgland are as follows:-

At the hilum and its surroundings, the nerve bundles consisting of nerve fibers of varying calibers were observed. They ran along with or separately from the blood vessels (Fig. 6). In the trabecula, a small number of the thick nerve fibers ran with fine nerve fibers and others without. They ended in the trabecula or in

the secondary follicle as simple free endings after ramification (Fig. 7-11).

According to UKEDA, the thick nerve fibers in the lymphgland may be sensory ones.

On the other hand, a great number of the fine nerve fibers or the nervous syncytia were found around the blood vessels, which may be vegetative in nature. These fine nerve fibers were also distributed up to the parenchyma (Fig. 12-14).

Nerve bundles in the capsule consisting of the nerve fibers in various thickness entered the trabecula (Fig. 15). In the surroundings of the blood vessels in the capsule, there were also fine nerve fibers and nervous syncytia.

Most of these nerve fibers including the nervous syncytia showed almost normal features, but the following changes were found in some of them.

1) Pathological change in the nerve fibers in the lymphgland with acute inflammation.

In some nerve bundles in the hilum, the nerve fibers were sparsely arranged and they gave various pathological appearances with large vacuoles, unhomogeneous impregnability and irregular swellings (Fig. 16-19). Some nerve fibers in the parenchyma showed a granular degeneration (Fig. 20). In the capsule or hilum, there appeared the nervous syncytia with a granular change in the fibrils within it (Fig. 21-22). Some nervous syncytia with the thick nerve fibers in them, showed a pathological change only in fine nerve fibers and none in the thick nerve fibers (Fig. 23).

2) Pathological change in the nerve fibers in the lymphgland with chronic inflammation.

Some nerve bundles in the hyperplasted capsule and in the hilum of the lymphgland, showed pathological change in a part of the nerve fibers, i. e. vacuoles, abnormal thickening with hyperchromasia and unhomogeneous impregnability (Fig. 24-28). In the trabecula, some thick nerve fibers swelled in places and indicated a deep hyperchomasia, and some fine nerve fibers accompanied with them showed partial swellings and vacuoles (Fig. 29-31).

In the fine nerve fibers and the nervous syncytia in the surrounding areas of the blood vessels, some showed a slight degeneration, but no marked change was observed there.

3) Pathological change in the nerve fibers in the lymphgland with hyperplasia of the lymphatic tissue.

No pathological change in the nerve fibers was found.

4) Pathological change in the nerve fibers in the lymphgland with tuberculous inflammation.

In the surrounding areas of the tubercle, no nerve fiber was observed. In other portions the nerve fibers were in an almost normal state.

5. DISCUSSION

YOSHIMATSU (1958) reported that many cases of acute appendicitis had acute inflammation in the ileocecal lymphglands, while most cases of chronic appendicitis

had chronic inflammation in the ileocecal lymphglands. He considered, therefore, that inflammation in the appendix had something to do with the inflammation in the ileocecal lymphgland.

PRIBRAM (1935) described that in some cases of severe acute appendicitis, any swelling of the ileocecal lymphgland was not observed, while in some other cases, only a slight inflammatory change in the appendix was found with a marked swellings of the ileocecal lymphglands.

According to the present study, the author found that many cases of acute ileocecal lymphadenitis also had acute inflammatory change in the appendix, and many cases of chronic ileocecal lymphadenitis also had chronic inflammatory change in the appendix. Therefore, the author's findings agree with the opinion stated by YOSHIMATSU.

However, there were some patients in whom no inflammatory change of the appendix was observed, in spite of the fact that an acute or a chronic inflammation, or a hyperplasia of the ileocecal lymphgland was found there. 5 of these 7 cases had many swelled lymphglands in the mesentery other than in the ileocecal region. 5 of these 7 cases were 11-15 year old patients.

These findings agree with the mesenteric lymphadenopathy reported by HAUSSER (1923) and IWANAGA (1933).

OKADA (1958), in his study on the nerve elements of the appendix, described that acute inflammation caused varying degrees of pathological change in the nerve elements of appendix in proportion to the intensity of inflammatory change in the appendix, while a marked proliferation of the nerve elements was found in chronic appendicitis.

The ileocecal lymphglands, according to the author's observation, had only a slight inflammatory change, and most of the nerve fibers were in almost normal aspect. However, some lymphglands in which an acute or a chronic inflammatory change was found, indicated a degeneration in a part of the thick nerve fibers which must be regarded as the sensory nerves.

These changes suggested the stimulation of the inflammatory substances on the nerve fibers. The sensory nerves may possibly be stimulated, and that will cause hypersensitivity of the lymphgland.

Some patients who complained of severe abdominal pain had an acute or a chronic inflammatory change in the ileocecal lymphglands with normal appendix or only a slight degree of chronic appendicitis. In these cases, the pathological change in the ileocecal lymphglands must not be neglected as the focus of abdominal pain.

6. SUMMARY AND CONCLUSION

The author studied pathological change in the ileocecal lymphglands and appendices in 23 cases on whom appendectomy was performed under the clinical diagnosis of appendicitis. Furthermore, he studied pathological change of nerve fibers in the ileocecal lymphglands.

The result have come to the following conclusions:

1) Many of the cases with whom an acute inflammatory change in the ileocecal lymphgland was found, had also an acute inflammatory change in the appendix. And many of the cases with whom a chronic inflammatory change in the ileocecal lymphgland was found, had also a chronic inflammatory change in the appendix. Therefore, the author considers that the inflammatory swelling of the ileocecal lymphglands has something to do with the inflammation in the appendix.

2) Most of the nerve fibers in the ileocecal lymphgland were observed in almost normal aspect. However, some lymphglands, in which an acute or a chronic inflammatory change was found, indicated a state of degeneration in the thick nerve fibers which must be regarded as the sensory nerves. Therefore, pathological change of the ileocecal lymphglands must not be neglected as the focus of abdominal pain.

I am very grateful to Assistant Professor Ch. KIMURA who gave me constant help and good suggestions throughout this work.

REFERENCES

1) Ito, M.: Die Nervöse Versorgung der Lymphatische Apparate. Jap. Jour. Med. Scien. Part 1 Anatomy, **11**, 149, 1943.
2) Iizuka, T.: Unspecific Mesenteric Lymphadenitis. Rinsho Geka, **11**, 397, 1956.
3) Inoue, R.: Pathohistologische Studien über Intramuralen Plexus des Colons bei Chronischer Obstipation, Nebst einigen Bemerkungen zur Chirurgischen Indikatoinsstellung. Arch. Jap. Chir., **27**, 1341, 1957.
4) Iwanaga, Z.: Mesenteric Lymphadenopathy. Kansai Izi, **3**, 115, 1933.
5) Kimura, Ch.: Abdominal Pain. Jour. Jap. Surg. Soc., **57**, 948, 1956.
6) Kubota, E.: Relation between the Histological Features of Appendicitis and the Clinical Findings. Hirosaki Med. Jour., **9**, 33, 1958.
7) Kato, T.: Observation of the Mesenteric Lymphgland. Rinsho Geka, **11**, 397, 1956.
8) Lee, I. M.: A Histological Study of Sensory Nerves in the Ascending Transverse and Descending Colon. Arch. Jap. Chir., **25**, 214, 1956.
9) Makino, K.: A Histological Study of Sensory Nerves in the Small Intestines and Cecum. Arch. Jap. Chir., **24**, 443, 1955.
10) Miyaji, T.: Clinical Histo-pathology. 1956.
11) Motegi, K.: Appendicitis. 1942.
12) Okada, M.: A Neuro-histological Study of Appendix. Kitano Hospital Jour. of Med., **4**, 4,1958.
13) Pribram, B. O.: Nabelkolik, Lymphangitische Form der Appendizitis und Lymphangitis Mesenterialis. Munchen Med. W. Schr., **87**, 942, 1935.
14) Sheehan, D.: The afferent Nerve Supply of the Mesentery and its Siginificance in the Causation of Abdominal Pain. Jour. of Anat., **117**, 233, 1933.
15) Sunder-Plasman, P.: Sympathicus Chirurgie. 1953.
16) Seto, H.: Progress of Medicine. **5**, 1949.
17) Ukeda, Y.: A Histological Study on the Afferent Innervation of the Lymphgland. Arch. Jap. Chir., **27**, 1357, 1958.
18) Yoshimatsu, M.: Regional Lymph Nodes in Appendicitis, Relation among Appendicitis, Mesoappendicitis and Lymphadenitis. Hirosaki Med. Jour., **9**, 48, 1958.
19) Yamaguchi, Y.: Reilly's Phenomenon. Saishin Igaku, **9**, 48, 1958.
20) Yamada, H.: A Neuro-pathologic Study on Chronic Gastritis, Gastric Ulcer and Gastric Cancer. Arch. Jap. Chir., **26**, 270, 1957.

Fig. 1 An ileocecal lymphgland with an acute inflammatory change. A marked dilatation of the sinus is shown. H-E. ×40

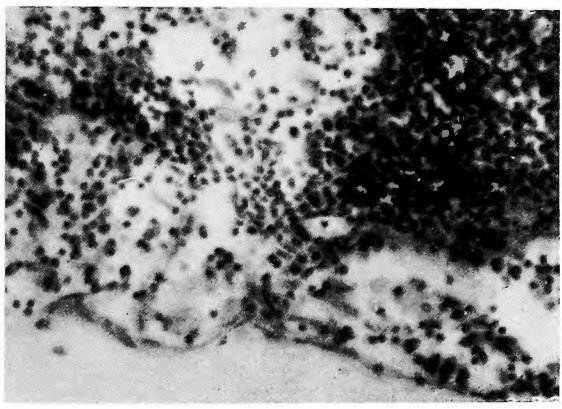

Fig. 2 Enlargement of Fig. 1. H-E. ×400

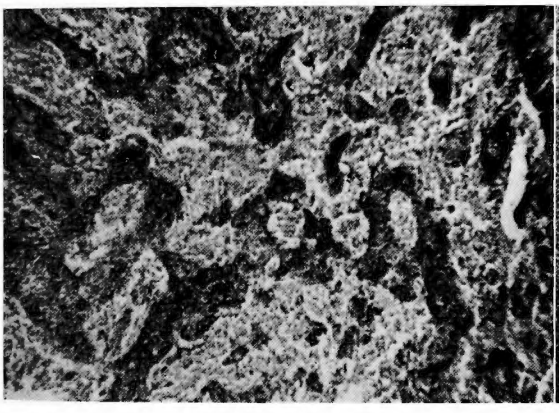

Fig. 3 An ileocecal lymphgland with a chronic inflammatory change. Proliferation of the reticular cells and atrophy of the parenchyma are shown. H-E. ×100

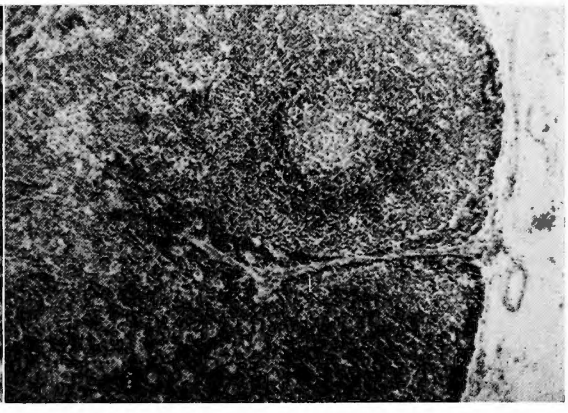

Fig. 4 An ileocecal lymphgland with a hyperplasia of the lymphatic tissue. H-E. ×100

Fig. 5 An ileocecal lymphgland with a tuberculous inflammatory change. A tubercle in the cortex is shown. H-E. ×100

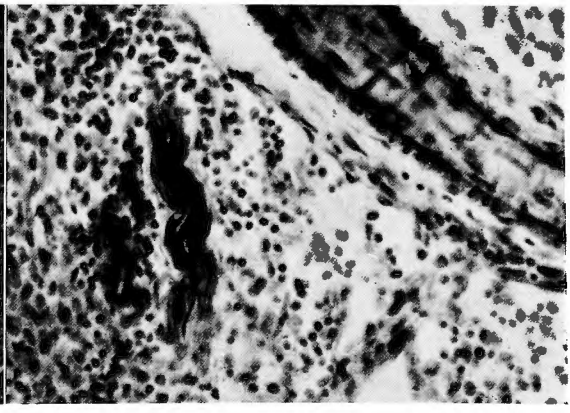

Fig. 6 An almost normal nerve bundle in the hilum of an ileocecal lymphgland with an acute inflammatory change. B-S. ×400

〔F. Maki〕

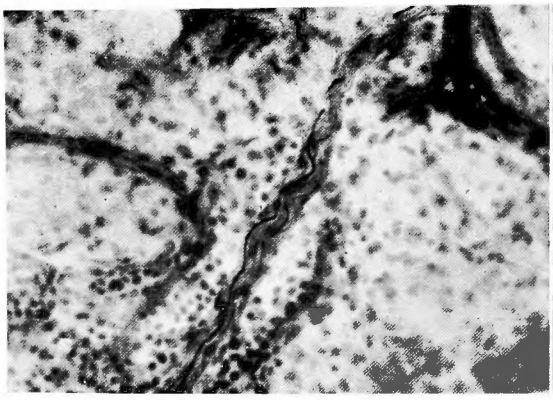

Fig. 7 An almost normal nerve bundle in the trabecula of a lymphgland with a chronic inflammatory change. B-S. ×400

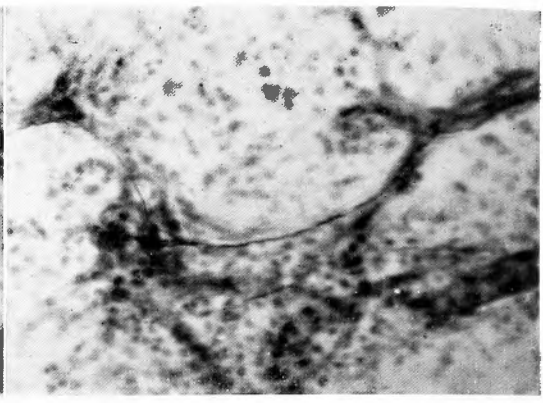

Fig. 8 Almost normal thick nerve fibers in the trabecula of a lymphgland with a chronic inflammatory change. B-S. ×400

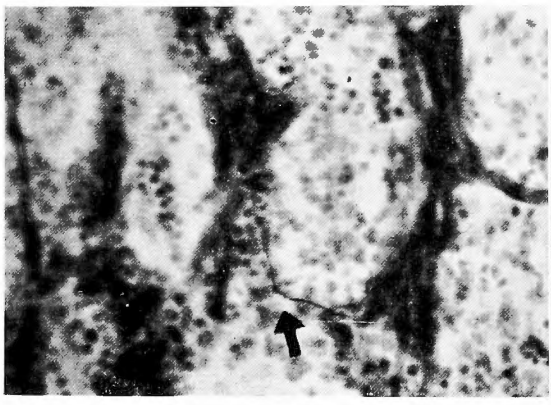

Fig. 9 Almost normal thick nerve fibers ending as the free termination in the trabecula of a lymphgland with a chronic inflammatory change. B-S. ×400

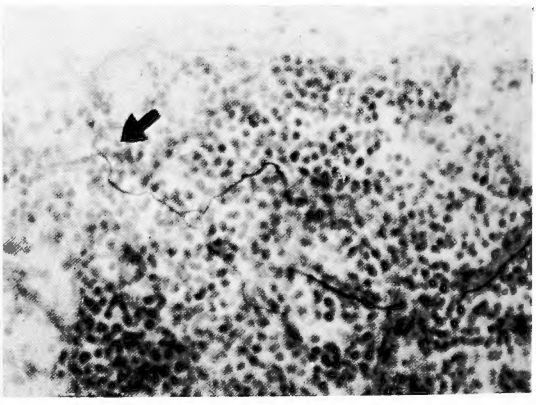

Fig. 10 Almost normal thick nerve fibers ending as the free termination in the secondary follicle of a lymphgland with a chronic inflammatory change. B-S. ×400

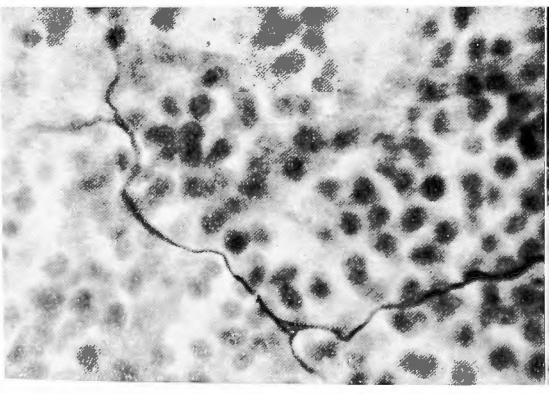

Fig. 11 Enlargement of Fig. 10. B-S. ×1000

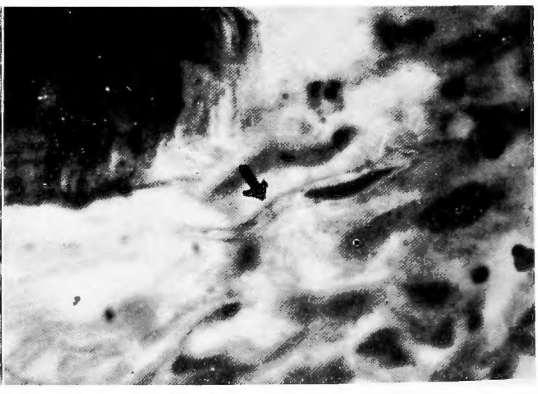

Fig. 12 An almost normal nervous syncytium running along a blood vessel of a lymphgland with an acute inflammatory change. B-S. ×1000 〔F. Maki〕

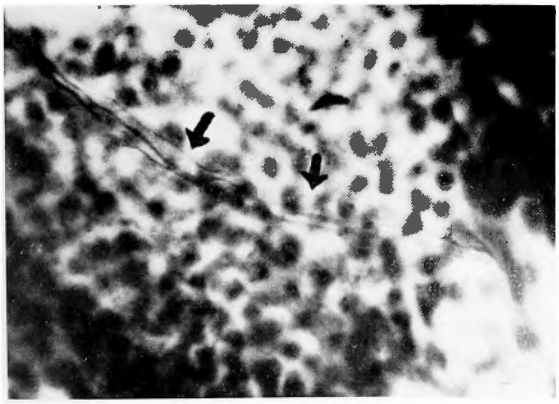

Fig. 13 Almost normal fine nerve fibers in the medullary cord of a lymphgland with a chronic inflammatory change. B-S. ×1000

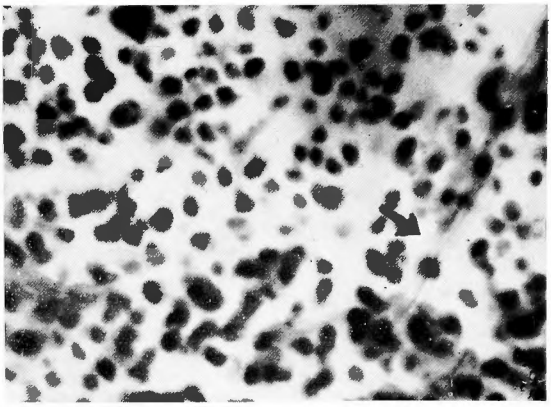

Fig. 14 Almost normal fine nerve fibers in the secondary follicle of a lymphgland with an acute inflammatory change. B-S. ×1000

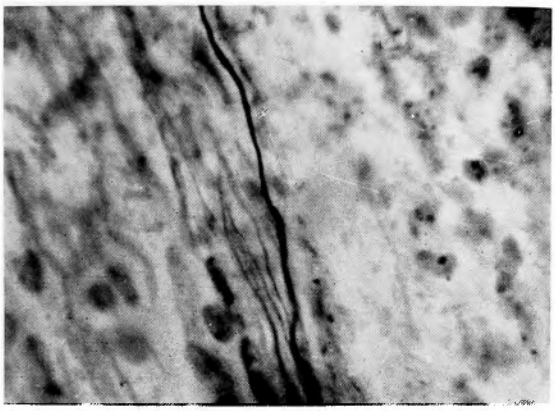

Fig. 15 An almost normal nerve bundle entering the trabecula from the capsule of a lymphgland with a chronic inflammatory change. B-S. ×1000

Fig. 16 An abnormal nerve bundle in the hilum of a lymphgland with an acute inflammatory change. The nerve fibers are sparsely arranged, and a large vacuole in the thick nerve fiber is shown. B-S. ×1000

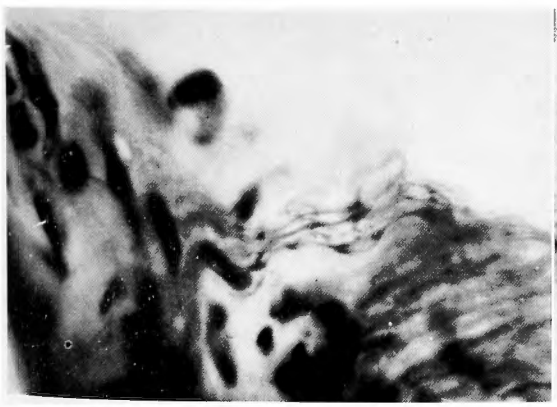

Fig. 17 Abnormal nerve bundles in the hilum of a lymphgland with an acute inflammatory change. Large vacuoles in the thick nerve fibers and granular change in the fine nerve fibers are shown. B-S. ×1000

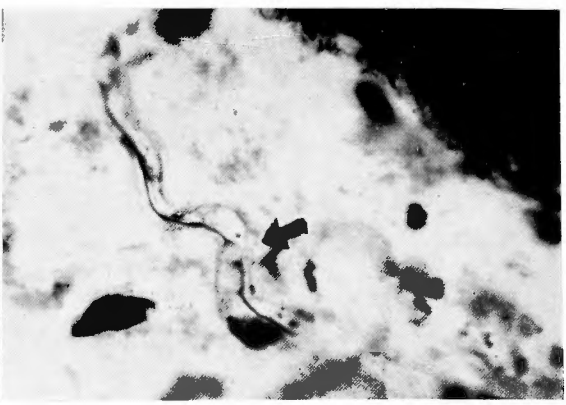

Fig. 18 An abnormal thick nerve fiber in the hilum of a lymphgland with an acute inflammatory change. Vacuoles in the thick nerve fiber is shown. B-S. ×1000

〔F. Maki〕

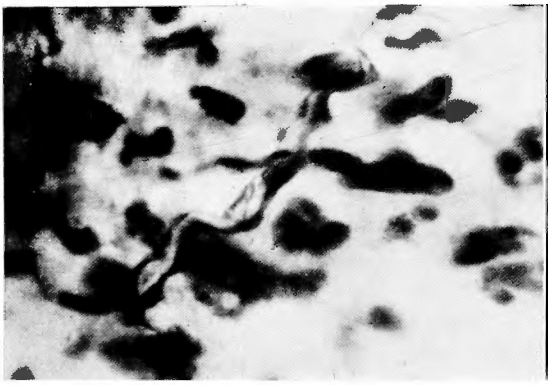

Fig. 19 Abnormal thick nerve fibers in the hilum of a lymphgland with an acute inflammatory change. Partial swellings of the nerve fibers are shown. B-S. ×1000

Fig. 20 An abnormal fine nerve fiber in the parenchyma of a lymphgland with an acute inflammatory change. Granular change in the nerve fiber is shown. B-S. ×1500

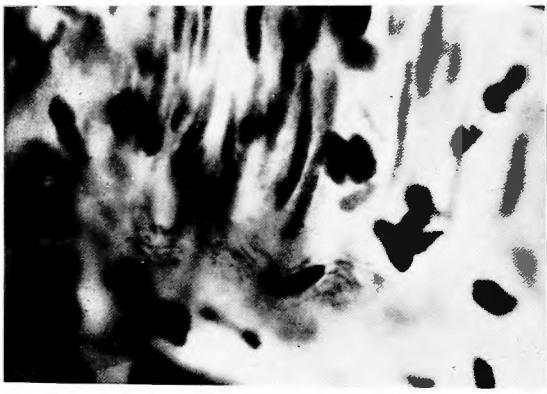

Fig. 21 A nervous syncytium around a blood vessel in the hilum of a lymphgland with an acute inflammatory change. Granular change of the fibrils is shown. B-S. ×1000

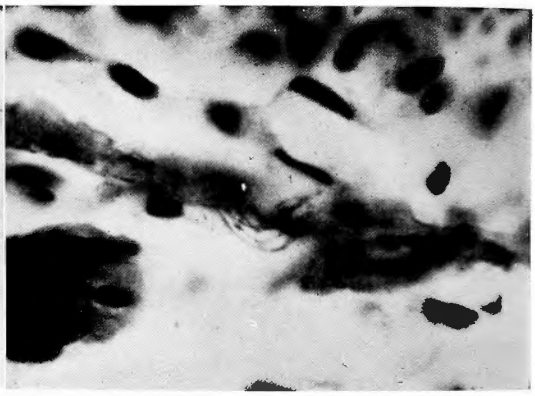

Fig. 22 Same findings as Fig. 21. B-S. ×1000

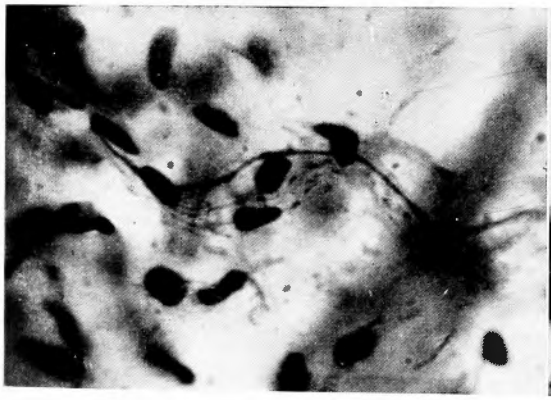

Fig. 23 An almost normal thick nerve fiber and nervous syncytia with a granular change are shown in the capsule of a lymphgland with an acute inflammatory change. B-S. ×1000

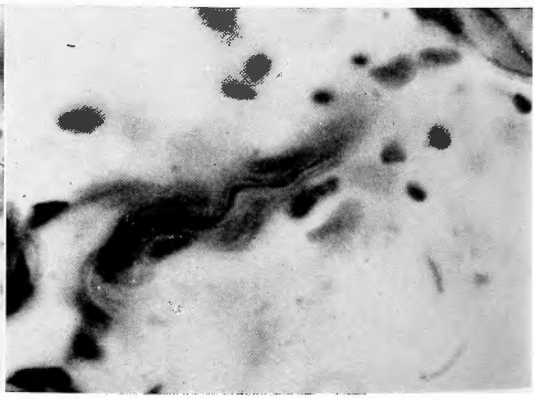

Fig. 24 An abnormal nerve bundle in the hilum of a lymphgland with a chronic inflammatory change. Partial swellings and vacuole in a thick nerve fiber are shown B-S. ×1000 〔F. Maki〕

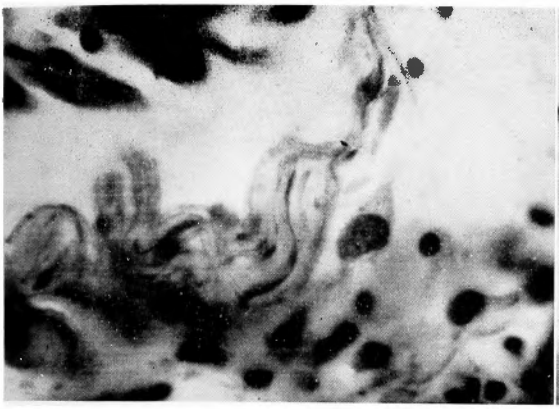

Fig. 25 An abnormal nerve bundle in the hilum of a lymphgland with a chronic inflammatory change. The nerve fibers are sparsely arranged, and partial swellings of the nerve fibers are shown. B-S. ×1000

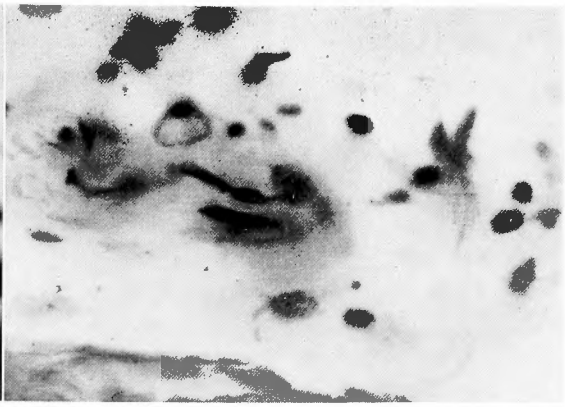

Fig. 26 An abnormal nerve bundle in the hilum of a lymphgland with a chronic inflammatory change. Abnormally swelled nerve fibers are shown. B-S. ×1000

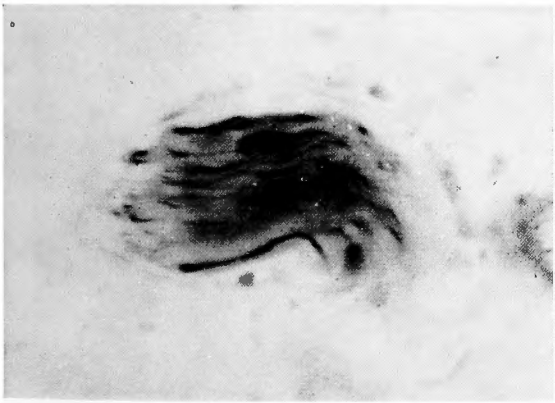

Fig. 27 An abnormal nerve bundle in the capsule of a lymphgland with a chronic inflammatory change. Abnormally thickened or swelled nerve fibers with unhomogeneous impregnability are shown. B-S. ×1000

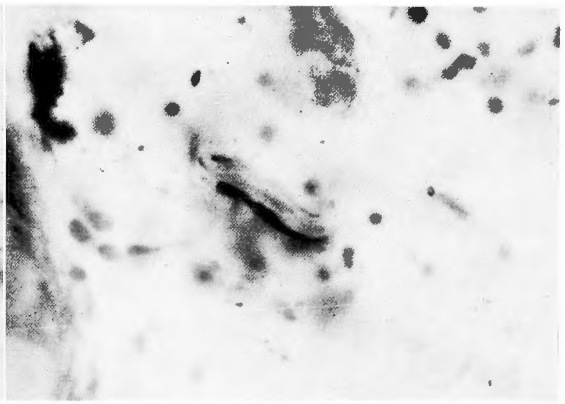

Fig. 28 Same findings as Fig. 27. B-S. ×1000

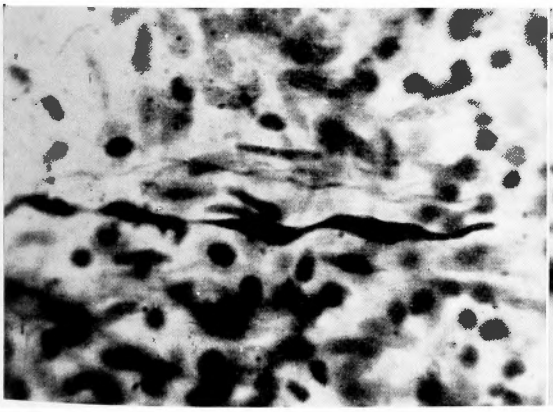

Fig. 29 An abnormally thickened nerve fiber in the trabecula of a lymphgland with a chronic inflammatory change. Partial swellings and deep hyperchromasia of the nerve fiber are shown. B-S. ×1000

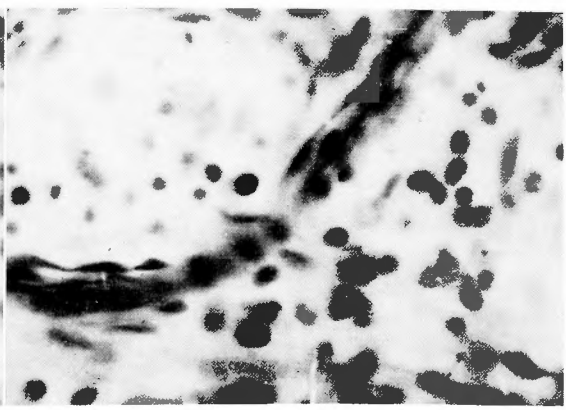

Fig. 30 Same findings as Fig. 29. B-S. ×1000

〔F. Maki〕

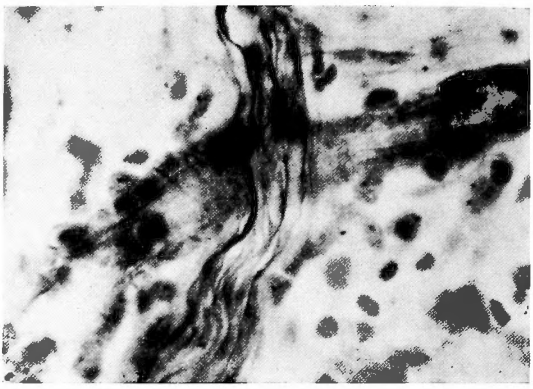

Fig. 31 An abnormal nerve bundle in the trabecula of a lymphgland with a chronic inflammatory change. Partial swellings, small vacuoles in the fine nerve fibers and unhomogenous impregnability in the thick nerve fiber are shown. B-S. ×1000

1) H-E.……Hematoxylin-eosin staining

2) B-S.……Bielschowsky-Suyuhi's silverimpragnation

和 文 抄 録

回盲部リンパ節炎の病理学的研究

——特に神経の変化に就いて——

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牧 文 彦

虫垂炎の臨床的診断のもとに開腹した23症例に就いて，回盲部リンパ節及び虫垂の病理学的変化を比較観察し，更に Bielschowsky 鈴木氏神経鍍銀法を用いて，回盲部リンパ節の神経の病理学的変化を追及し次のような結果を得た．

1) 回盲部リンパ節に急性炎症性変化を認めた症例では，虫垂にも急性炎症性変化をみることが多く，また回盲部リンパ節に慢性炎症性変化を認めた症例では，虫垂にも慢性炎症性変化をみることが多かつた．従つて，回盲部リンパ節の炎症性腫張は虫垂の炎症と或程度の関連性を有していることが伺われる．

2) 之等の回盲部リンパ節に於ていは，大部分の神経線維は略々正常の形態を示した．然し乍ら，急性或いは慢性炎症性変化を有するリンパ節の中には，知覚神経と見做される太い神経線維に変性像を示すものがあつた．従つて，腹痛の一原因として回盲部リンパ節の病変を無視することは出来ない．